

# **—Standard Valves—**

4205-E Valve  
M.4205-E Valve

## **4205-E AND M.4205-E VALVES**

TRIODE.

M.4205-E valve is similar to 4205-E but has the grid and anode specially treated to reduce secondary emission.

### **SPECIFICATION.**

#### **Cathode.**

Oxide coated filament.

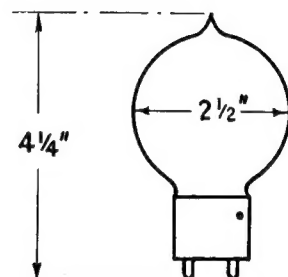
Constant current type.

#### **Base.**

Medium 4-pin bayonet thrust, with offset pin.

#### **Dimensions.**

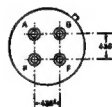
|                |                               |
|----------------|-------------------------------|
| Overall length | 4 $\frac{1}{4}$ " (10.8 cms.) |
| Bulb diameter  | 2 $\frac{1}{2}$ " (6.4 cms.)  |
| Net weight     | 0.14 lbs. (65 gms.)           |



#### **Constants.**

|                          |                |
|--------------------------|----------------|
| Filament current         | 1.6 amps.      |
| Nominal filament voltage | 4.5 volts      |
| *Impedance               | 3,500 ohms     |
| *Amplification factor    | 7              |
| *Mutual conductance      | 2 mA. per volt |
| Anode-grid capacity      | 4.8 $\mu$ F.   |
| Anode-filament capacity  | 3.3 $\mu$ F.   |
| Grid-filament capacity   | 5.2 $\mu$ F.   |

\* at anode current of 30 mA.



### **LIMITING CONDITIONS FOR SAFE OPERATION.**

|   |           |
|---|-----------|
| Maximum direct anode voltage                  | 400 volts |
| Maximum direct anode current                  | 50 mA.    |
| Maximum anode dissipation                     | 15 watts  |
| Maximum direct grid current                   | 10 mA.    |
| Maximum frequency for above ratings           | 15 Mc.    |
| Maximum anode voltage for frequency of 30 Mc. | 300 volts |

V.4205-E.1  
Nov. 1937

# —Standard Valves—

## TYPICAL OPERATING CONDITIONS.

| Anode voltage | Grid bias | Anode current | Amplification factor | Anode resistance | Load resistance | Power output | Second Harmonic |
|---------------|-----------|---------------|----------------------|------------------|-----------------|--------------|-----------------|
| volts         | volts     | mA.           |                      | ohms             | ohms            | mW.          | db              |
| 200           | —6        | 22.5          | 7.4                  | 4,000            | 4,000           | 60           | 35              |
|               |           |               |                      |                  | 8,000           | 55           | 40              |
| 250           | —22       | 9             | 6.9                  | 6,000            | 6,000           | 500          | 18              |
|               |           |               |                      |                  | 12,000          | 450          | 22              |
|               |           |               |                      |                  | 18,000          | 380          | 26              |
| 250           | —15       | 19            | 7.2                  | 4,350            | 4,350           | 310          | 26              |
|               |           |               |                      |                  | 8,700           | 280          | 30              |
| 250           | —10       | 27.5          | 7.4                  | 3,800            | 3,800           | 180          | 33              |
|               |           |               |                      |                  | 7,600           | 160          | 38              |
| 250           | —5        | 37.5          | 7.5                  | 3,500            | 3,500           | 50           | 40              |
|               |           |               |                      |                  | 7,000           | 45           | 43              |
| 300           | —30       | 8             | 6.7                  | 6,700            | 6,700           | 800          | 15              |
|               |           |               |                      |                  | 13,400          | 720          | 20              |
|               |           |               |                      |                  | 19,100          | 600          | 24              |
| 300           | —24       | 15.5          | 7.1                  | 4,800            | 4,800           | 750          | 20              |
|               |           |               |                      |                  | 9,600           | 670          | 25              |
| 300           | —18       | 25            | 7.3                  | 4,000            | 4,000           | 540          | 27              |
|               |           |               |                      |                  | 8,000           | 480          | 31              |
| 350           | —22.5     | 29            | 7.3                  | 3,800            | 3,800           | 875          | 26              |
|               |           |               |                      |                  | 7,600           | 800          | 30              |
| 375           | —30       | 22            | 7.1                  | 4,300            | 4,300           | 1,300        | 20              |
|               |           |               |                      |                  | 8,600           | 1,200        | 26              |
| *300          | —10       | 41            | 7.4                  | 3,350            | 3,350           | 200          | 37              |
|               |           |               |                      |                  | 6,700           | 180          | 41              |
| *350          | —20       | 34            | 7.3                  | 3,600            | 3,600           | 750          | 28              |
|               |           |               |                      |                  | 7,200           | 675          | 32              |
| *375          | —24       | 32            | 7.3                  | 3,650            | 3,650           | 1,000        | 26              |
|               |           |               |                      |                  | 7,300           | 900          | 30              |
| *400          | —29       | 30            | 7.2                  | 3,800            | 3,800           | 1,400        | 23              |
|               |           |               |                      |                  | 7,600           | 1,300        | 28              |

\* Maximum operating conditions.

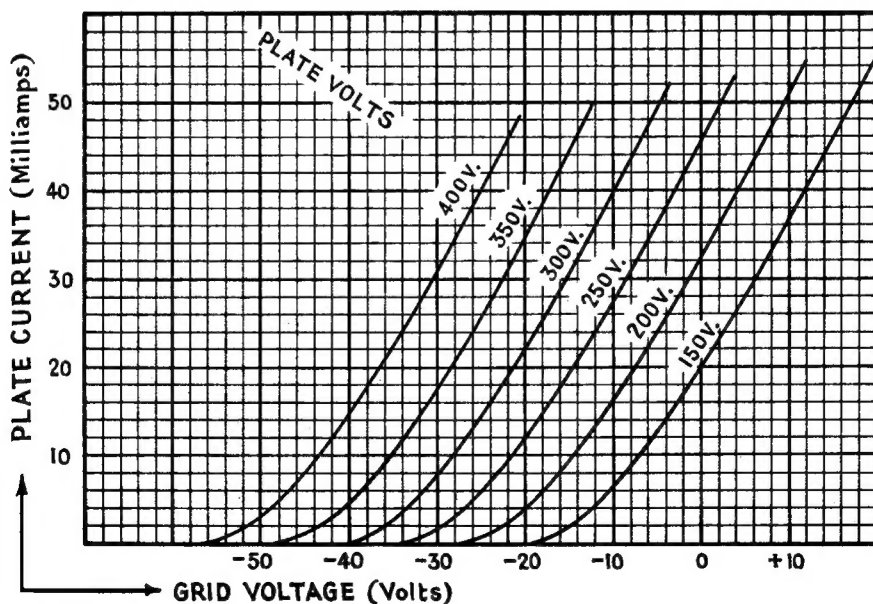
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## RADIO FREQUENCY OPERATION.

|                      | Class B<br>Telephony                    |       | Class C<br>Telephony              |       | Class C<br>Telegraphy |                |
|----------------------|---|-------|-----------------------------------|-------|-----------------------|----------------|
|                      | Modulated<br>Carrier<br>applied to grid |       | Subject to<br>anode<br>modulation |       | Unmodulated           |                |
| Direct anode voltage | 350                                     | 400   | 300                               | 350   | 350                   | 400 volts      |
| Direct anode current | 28                                      | 28    | 35                                | 35    | 45                    | 45 mA.         |
| Grid bias            | -48                                     | -56   | -120                              | -144  | -96                   | -112 volts     |
| Driving voltage—     |   |       |                                   |       |                       |                |
| Carrier              | 69                                      | 73    | —                                 | —     | —                     | — peak volts   |
| A-F peak             | 138                                     | 146   | —                                 | —     | —                     | — volts        |
| Driving voltage      | —                                       | —     | 205                               | 229   | 186                   | 202 peak volts |
| Power output—        |   |       |                                   |       |                       |                |
| Carrier              | 2.5                                     | 3.0   | —                                 | —     | —                     | — watts        |
| A-F peak             | 10                                      | 12    | —                                 | —     | —                     | — watts        |
| Power output         | —                                       | —     | 6.0                               | 7.1   | 8.3                   | 10.0 watts     |
| Effective load—      |   |       |                                   |       |                       |                |
| Resistance           | 3,100                                   | 3,700 | 4,000                             | 5,000 | 3,750                 | 4,500 ohms     |
| Peak driving—        |   |       |                                   |       |                       |                |
| Power-peak           | 1                                       | 1     | —                                 | —     | —                     | — watts        |
| Driving power        | —                                       | —     | 1.3                               | 1.7   | 1.3                   | 1.5 watts      |

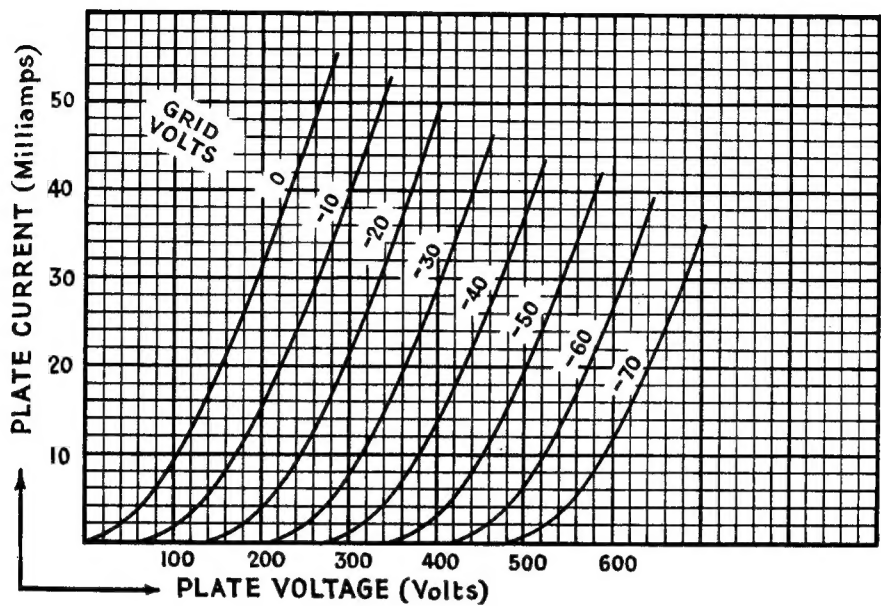
These curves are taken with direct filament heating, grid and anode voltages being referred to negative end of filament.



V.4205-E.2  
Nov. 1937

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